

IN THE CLAIMS:

Please write the claims as follows:

- 1 1. (Original): A policer based on Random Early Detection (RED), comprising:
2 a filter that determines a filtered virtual time debt; and
3 a control law circuit that receives the filtered virtual time debt from the filter and
4 determines whether a packet should be dropped.
- 1 2. (Original): The RED policer of claim 1, wherein a virtual time debt uses a time T in
2 which a packet is expected to arrive and is computed using a predetermined output
3 transmission rate.
- 1 3. (Original): The RED policer of claim 2, wherein predetermined output transmission
2 rate is given by a traffic contract.
- 1 4. (Original): The RED policer of claim 1, wherein the filter is based on an exponential
2 weighted moving average (EWMA) virtual time delay using the expression,
3
$$EWMA_k = (1-g)EWMA_{k-1} + g(VTD)_k,$$

4 where k indicates the presently received packet, and k-1 indicates the EWMA
5 computed when the last packet was received, the virtual time debt (VTD) is computed by
6 the expression: $VTD = T(\text{packet expected to arrive}) - T(\text{packet actually arrives})$, and g is
7 the gain of the filter.

1 5. (Original): The RED policer of claim 1, further comprises a sampler that samples a
2 virtual time debt at a sampling interval, and transmits the sampled virtual time debt to the
3 filter.

1 6. (Original): The RED policer of claim 1, further comprises:

2 a random generator that generates a number based on the control law circuit's
3 determination as to whether a packet should be dropped; and

4 a counter that is set with the number generated by the random generator, wherein
5 the counter counts packets passing through the RED policer up to the set number, and
6 wherein the RED policer drops a packet when the counter has counted out the set num-
7 ber.

1 7. (Original): The RED policer of claim 6, further comprises:

2 the control law circuit that determines a probability of a packet being dropped
3 based on the filtered time debt exceeding a predetermined minimum threshold, and speci-
4 fies a range of numbers based on the probability; and

5 the random generator that randomly generates a number in the range specified by
6 the control law circuit.

1 8. (Original): A policer based on Random Early Detection (RED), comprising:

2 means for determining a moving average of a virtual time debt; and

3 means for determining whether a packet should be dropped based on a value of
4 the moving average of the virtual time debt.

1 9. (Original): The RED policer of claim 8, further comprises means for sampling a vir-
2 tual time debt at a sampling interval, and transmitting the result to the moving average
3 determining means.

1 10. (Original): The RED policer of claim 8, further comprises:

2 means for generating a random number based on the result of the packet dropping
3 means; and

4 means for counting a number of packets passing through the RED policer up to
5 the random number generated by the random number generating means, wherein the
6 RED policer drops a packet when the counting means has counted out the generated ran-
7 dom number.

1 11. (Original): A network device comprising:

2 a plurality of Random Early Detection (RED) policers, wherein each RED policer
3 includes,

4 a filter that determines a filtered virtual time debt; and

5 a control law circuit that receives the filtered virtual time debt from the
6 filter and determines whether a packet should be dropped; and

7 a packet classifier that determines which packet should go to which RED policer.

1 12. (Currently Amended): A method of policing packets in a network device, the
2 method comprising the steps of:

3 determining a filtered virtual time debt of a traffic;

4 comparing the filtered virtual time debt with a predetermined minimum threshold;

5 and if the filtered virtual time debt exceeds the minimum threshold, then

6 generating a random number that is used to determine which packet should ~~to be~~
7 dropped.

1 13. (Original): The method of claim 12, wherein generating a random number further
2 comprises the steps of:

3 generating the random number in a range based on a level by which the filtered
4 virtual time debt exceeds the minimum threshold;

5 setting a counter with the random number; and

6 dropping a packet when the counter has counted out the random number.

1 14. (Currently Amended): A computer readable medium having instructions contained
2 therein, which when executed by a computer performs a method comprising the steps of:

3 determining a filtered virtual time debt of a traffic;

4 comparing the filtered virtual time debt with a predetermined minimum threshold;

5 and if the filtered virtual time debt exceeds the minimum threshold, then

6 generating a random number that is used to determine which packet should ~~to be~~
7 dropped.

1 15. (Original): The medium of claim 14, wherein generating a random number further
2 comprises the steps of:

3 generating the random number in a range based on a level the filtered virtual time
4 debt exceeds the minimum threshold;

5 setting a counter with the random number; and

6 dropping a packet when the counter has counted out the random number.

1 16. (Currently Amended): Electromagnetic signals propagating over a computer net-
2 work, said electromagnetic signals carrying instructions for execution on a processor for
3 the practice of practicing the method of claim 12, comprising the steps of:
4 determining a filtered virtual time debt of a traffic;
5 comparing the filtered virtual time debt with a predetermined minimum threshold;
6 and if the filtered virtual time debt exceeds the minimum threshold, then
7 generating a random number that is used to determine which packet should be
8 dropped.

Please insert new claims 17 *et seq.*

1 17. (New) A method of policing packets in a network device, the method comprising the
2 steps of:

3 determining a virtual time debt of packets flowing through the network device;
4 and

5 determining whether a packet should be dropped based on the virtual time debt of
6 the packets.

1 18. (New) The method as in claim 17, further comprising: determining that a packet
2 should be dropped when a virtual time debt threshold has been reached.

1 19. (New) The method as in claim 17, further comprising: determining a moving aver-
2 age of the virtual time debt.

1 20. (New) The method as in claim 17, further comprising: calculating the virtual time
2 debt as the difference between a time a packet is expected to arrive and a time the packet
3 actually arrives.

1 21. (New) The method as in claim 20, further comprising: calculating the time a packet
2 is expected to arrive according to a traffic contract.

1 22. (Original): The method as in claim 17, further comprising: sampling the virtual time
2 debt at a sampling interval.

1 23. (Original): The method as in claim 17, further comprising:

2 generating a random number;

3 counting a number of packets passing through the network device up to the ran-
4 dom number; and

5 dropping a packet when the counted number reaches the random number.

1 24. (New) A method of policing packets in a network device, the method comprising the
2 steps of:

3 determining a virtual time debt of packets flowing through the network device,
4 the virtual time debt computed as a difference between an expected packet arrival time
5 established by a traffic contract and an actual packet arrival time;

6 determining that packets should be dropped when the virtual time debt of the
7 packets exceeds a predetermined value; and if so

8 choosing a packet to be dropped, the chosen packet, in response to a random
9 number; and

10 dropping the chosen packet.

1 25. (New) The method as in claim 24, further comprising:

2 generating the random number

3 counting a number of packets passing through the network device up to the ran-
4 dom number; and

5 dropping a packet when the counted number reaches the random number.

1 26. (New) A policer, comprising:

2 means for determining a virtual time debt of packets flowing through the network
3 device, the virtual time debt computed as a difference between an expected packet arrival
4 time established by a traffic contract and an actual packet arrival time;

5 means for determining that packets should be dropped when the virtual time debt
6 of the packets exceeds a predetermined value; and if so

7 means for choosing a packet to be dropped, the chosen packet, in response to a
8 random number; and

9 means for dropping the chosen packet.

1 27. (New) A computer readable media, the computer readable media containing instruc-
2 tions for execution in a processor for the practice of the method comprising the steps of:

3 determining a virtual time debt of packets flowing through the network device;
4 and

5 determining whether a packet should be dropped based on the virtual time debt of
6 the packets.

1 28. (New) Electromagnetic signals propagating on a computer network, the electromag-
2 netic signals carrying instructions for execution in a processor for the practice of the
3 method comprising the steps of:

4 determining a virtual time debt of packets flowing through the network device;
5 and

6 determining whether a packet should be dropped based on the virtual time debt of
7 the packets.